

NAS NORTH ISLAND - NAVY REGION SOUTHWEST NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

POLLUTION PREVENTION

MAGNETIC PARTICLE FLUID PURIFIER

LEAD ACTIVITY

Naval Air Station (NAS) North Island

STATUS

Complete

MISSION

Purify the oil used during the magnetic particle nondestructive inspection (NDI) on aircraft and non-aircraft components/parts to locate defects

REQUIREMENT

Magnetic particle inspection is performed on aircraft and non-aircraft components and parts to locate parts defects using fluorescent particles suspended in an oil bath. After a period of time, the oil bath degrades and becomes contaminated. A method for reducing this hazardous waste generated during magnetic particle inspection is required.

DESCRIPTION

Magnetic particle inspection on aircraft and non-aircraft components/parts is performed to locate defects. In order to locate parts defects, an oil bath containing minute fluorescent (visible with a blacklight) particles is applied to a ferrous component and then magnetized. The magnetic field aligns the fluorescent particles with the defect so it can then be located by use of a blacklight under darkened conditions. After a period of time (usually 2 months), the oil bath and particles degrades and becomes contaminated, depending on the number of parts being inspected. The used oil is then completely drained from the holding tank of the magnetic particle machine into its original 5-gallon container(s) and disposed of as hazardous waste.



Magnetic Particle Fluid Purifier

At NAS North Island, the Magnetic Particle Fluid Purifier is being used to filter and reuse the contaminated oil bath from the magnetic particle inspection machine. This filtering process is a prototype effort of the Chief of Naval Operations (CNO) Pollution

Prevention Equipment Program (PPEP) involving the procurement, installation, training, and demonstration of pollution prevention equipment. The Magnetic Particle Fluid Purifier filters out the contaminants (dirt, water, grease, used magnetic particles) leaving a virtually clean, reusable oil bath. In addition, there is no detectable trace of stripped fluorescence remaining in the oil bath. After new fluorescent particles are added to the filtered bath and tested, normal inspections can continue until the bath degrades again. A cost-benefit analysis report will be prepared at the end of the prototype testing period.

BENEFITS

- Reduces quantity and cost of hazardous waste disposal
- Reduces requirement for procurement of new fluid and associated costs
- Provides a healthier work environment

ACCOMPLISHMENTS/CURRENT STATUS

Date	Activity
MAY 1998	Site requirements completed and Operation Test Plan was finalized
JUN 1998	Equipment delivered to the site and installed
JUL 1998	System put into operation and prototype testing began
JUL 1999	Final report, including cost-benefit analysis, issued

FUTURE PLAN OF ACTION & MILESTONES

Not Applicable

COLLABORATION/TECHNOLOGY TRANSFER

Through partnering efforts with PPEP and the Naval Air Warfare Center (NAWC) Lakehurst, Aircraft Division, NAS North Island was able to obtain the purifier.

BIBLIOGRAPHY

None available

RELATED GOVERNMENT INTERNET SITES

[PPEP Book web page](#)

RELATED NAVY GUIDEBOOK REQUIREMENTS

- 10003 Cost Effective Waste Reduction

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